

Test Review

32. Amusement Rides

A popular ride at an amusement park is called the "Ring of Terror." It is like a Ferris wheel but is inside a haunted house. Riders board on a platform that is level with the centre of the "ring," and the ring moves counterclockwise. When a rider is moving above the platform, he or she meets flying creatures. When the seat descends to a level below the platform, creatures emerge from a murky, slimy pit. The radius of the ring is 6 m.

a) Graph the height of a rider with respect to the platform through three revolutions of the ride.

b) Determine the amplitude, period, equation of the axis, and the range of your graph.

c) Discuss how your graph would change if the rider got on the ride in the pit, at the bottom of the ring.

Dec 6-8:16 AM

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c) Discuss how your graph would change if the rider got on the ride in the pit, at the bottom of the ring.

$a = 6$
 $p = 360$
 $y = 6$
 $R = \{f(x) \in \mathbb{R} \mid 0 \leq f(x) \leq 12\}$
 $f(x) = -6 \sin\left(\frac{x}{360}\right) + 6$

Dec 6-8:16 AM

$f(x) = a \sin(x - c) + d$

1. Graph each sinusoidal function. If you are using a graphing calculator, set it to DEGREE mode and use the WINDOW settings shown at the left. State the amplitude, period, equation of the axis, domain, and range for each function.
- a) $f(x) = \sin x + 4$ c) $f(x) = 2 \sin x$
b) $f(x) = \sin(x + 30^\circ)$ d) $f(x) = -0.5 \sin x$
2. Sketch three cycles of a sinusoidal function that has a period of 30, an amplitude of 6, and whose axis is $y = 11$.

Dec 6-8:55 AM

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$y = a \sin(x - c) + d$

$a = \text{amp}$
 $c = \text{hor.}$
 $d = \text{vertical translation}$

$y = \sin x + 4$

0	0	4
90	1	5
180	0	4
270	-1	3
360	0	4

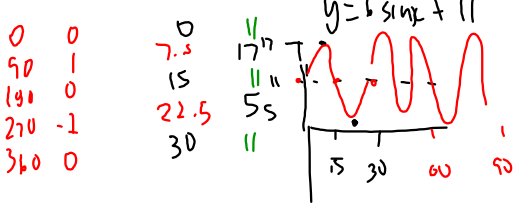
Dec 6-8:55 AM

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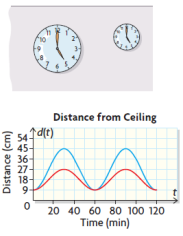
0	11
7.5	17
15	11
22.5	5
30	11

Dec 6-10:45 AM

1. Graph each sinusoidal function. If you are using a graphing calculator, set it to DEGREE mode and use the WINDOW settings shown at the left. State the amplitude, period, equation of the axis, domain, and range for each function.
- a) $f(x) = \sin x + 4$ c) $f(x) = 2 \sin x$
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Dec 6-10:45 AM



Distance from Ceiling

$d(t)$

Time (min)

3. The hands on a wall clock move in a predictable manner. As time passes, the distance between the tip of the minute hand and the ceiling changes. Suppose we have two different wall clocks. The two graphs model the relationship between distance and time.

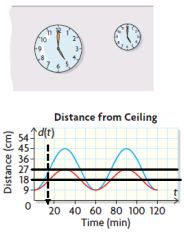
- Determine each of the following and explain what they represent in this situation: period, equation of the axis, and amplitude.
- What was the initial position of the tip of the minute hand?
- What is the range for each function?
- Approximate the distance between the minute hand and the ceiling for each clock at $t = 80$ min.
- Draw a diagram showing the position of the clocks relative to the ceiling. Include all relevant numbers on your diagram.

4. The function $f(x) = \sin x$ undergoes a reflection in the x-axis and a vertical stretch of 2.

- Write the resulting equation of the function.
- Sketch the resulting graph.
- State the amplitude, equation of the axis, period, domain, and range.

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Dec 6-8:56 AM



Distance from Ceiling

$d(t)$

Time (min)

3. The hands on a wall clock move in a predictable manner. As time passes, the distance between the tip of the minute hand and the ceiling changes. Suppose we have two different wall clocks. The two graphs model the relationship between distance and time.

- Determine each of the following and explain what they represent in this situation: period, equation of the axis, and amplitude.
- What was the initial position of the tip of the minute hand?
- What is the range for each function?
- Approximate the distance between the minute hand and the ceiling for each clock at $t = 80$ min.
- Draw a diagram showing the position of the clocks relative to the ceiling. Include all relevant numbers on your diagram.

4. The function $f(x) = \sin x$ undergoes a reflection in the x-axis and a vertical stretch of 2.

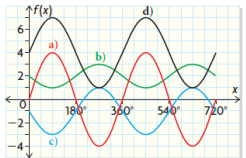
- Write the resulting equation of the function.
- Sketch the resulting graph.
- State the amplitude, equation of the axis, period, domain, and range.

p380

Dec 6-8:56 AM

5. Sketch the sinusoidal function $f(x) = \sin(x + 90^\circ) + 5$. Verify your answer using graphing technology.

6. Determine the equation of each function in the graph shown.

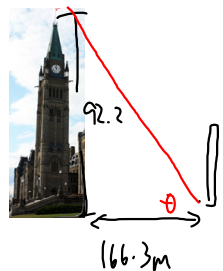


p380

Dec 6-8:57 AM

Kyle is looking at the top of the Peace Tower. The building is known to be 92.2 m tall. If Kyle is 166.3 m from the building, what is the angle of elevation at which he is looking at the building?

Dec 6-8:57 AM



92.2

166.3m

θ

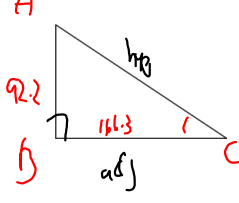
SOH CAH TOA

$\tan \angle C = \frac{92.2}{166.3}$

$\tan \angle C = (0.5544)$

$\angle C = \tan^{-1}(0.5544)$

$\angle C = 29^\circ$



92.2

166.3

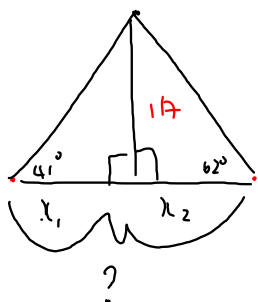
$\angle C$

Nov 28-9:12 AM

p 316 #8

Nov 28-9:19 AM

8. A weather balloon at a height of 117 m has an angle of elevation of 41° from one station and 62° from another. If the balloon is directly above the line joining the stations, how far apart, to the nearest metre, are the two stations?



Nov 28-9:25 AM

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$42^2 = 62^2 + 54^2 - 2(62)(54) \cos A$$

$$1764 = 3844 + 2916 - 6696 \cos A$$

$$1764 = 6760 - 6696 \cos A$$

$$1764 - 6760 = -6696 \cos A$$

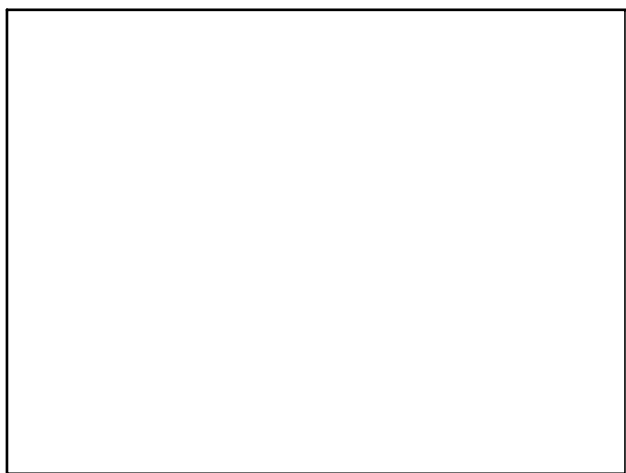
$$\frac{-4996}{-6696} = \cos A$$

$$0.7461 = \cos A$$

$$\cos^{-1}(0.7461) = A$$

$$72^\circ = A$$

Apr 28-1:33 PM



May 1-10:27 AM